



## DEPARTMENT OF LABOR

### Bureau of Labor Statistics

#### Comment Request

**AGENCY:** Bureau of Labor Statistics, Department of Labor.

**ACTION:** Request for comments on proposed action.

**SUMMARY:** The Department of Labor, through the Bureau of Labor Statistics (BLS) and, specifically, the International Price Program (IPP), is soliciting comments on its plan to improve the Import and Export Price Indexes (MXPI) estimates by using administrative trade data acquired from the U.S. Census Bureau. IPP is responsible for the estimation and publication of the U.S. Principal Federal Economic Indicator of Import and Export Price Indexes (MXPI). The IPP collects data from companies on import and export prices and estimates price indexes for nearly all goods trade and some service trade for the United States. The data are primarily collected with a business survey. After completion of extensive research, and in response to a decline in data collected through traditional survey methods, BLS plans to implement improvements to the quality and quantity of import and export price indexes in fiscal year 2025 by replacing data directly collected from the business survey with administrative trade records for select homogeneous product areas.

**DATES:** Written comments must be submitted to the office listed in the Address section of this notice on or before (**INSERT DATE 45 DAYS AFTER PUBLICATION IN THE *FEDERAL REGISTER***).

**ADDRESSES:** Written comments may be submitted by postal mail to Susan E. Fleck, International Price Program, U.S. Bureau of Labor Statistics, Room 2150, Postal Square Building, Massachusetts Avenue, N.E., Washington, D.C. 20212, or by email to: [IPP\\_FRN@bls.gov](mailto:IPP_FRN@bls.gov).

**FOR FURTHER INFORMATION CONTACT:** Susan Fleck, International Price Program, Bureau of Labor Statistics, by phone at 202-691-6043 or by email at [IPP\\_FRN@bls.gov](mailto:IPP_FRN@bls.gov).

**SUPPLEMENTARY INFORMATION:**

**I. Introduction**

The Department of Labor, through the Bureau of Labor Statistics, is responsible for the development and publication of Import and Export Price Index statistics through the International Price Program (IPP). Currently, monthly estimates of import and export price indexes for merchandise goods are published for approximately 740 industry and product classification areas, including the Harmonized System, Bureau of Economic Analysis (BEA) End Use System, and North American Industry Classification System (NAICS). Every month, approximately 17,000 prices for merchandise goods are collected from businesses using the International Price Survey. The participating businesses are selected based on a statistically representative sample of import and export goods trade.

The International Price Program has developed an approach to

maintain and expand the number of publishable price indexes of merchandise goods for the Import and Export Price Indexes. IPP plans to replace approximately a third of the sample of merchandise goods trade with administrative trade transaction records. The improvement is focused on homogeneous products; monthly prices are calculated from detailed unit values derived from timely trade transaction records. These administrative records are reported by companies for regulatory purposes and are used by the BLS for statistical purposes only. The administrative records are compiled by the U.S. Census Bureau to publish official international trade statistics. The Census Bureau is collaborating with BLS to share the records for use in calculation of the MXPI. These records have not been used previously to calculate monthly price indexes. Rather, they have been used by BLS at an aggregate level on an annual basis to establish the sample frame for the International Price Survey and to calculate annual trade weight shares.

This new process is the culmination of a long-standing BLS objective to mitigate the decline in the number of items whose prices support the published indexes. In a multi-year, multi-project initiative that began in FY2018, the following proposed improvements to import and export price indexes for homogeneous products have been validated and are scheduled to be implemented:

- Replace prices collected using the business survey with

unit values of trade transaction records for the subset of homogeneous merchandise goods. This is accomplished by introducing the following improvements:

- Revision to sample selection process to replace directly collected prices from select sampled product areas with current-period transaction values of administrative trade records for similar goods.
- Application of a matched-model approach to administrative trade records to create unique product varieties that are consistently traded over time by:
  - Applying a rigorous approach to define unit values and product varieties that mitigates unit value bias.
  - Using coefficient of variation and other statistics to evaluate and rank homogeneity of product varieties and product categories.
  - Grouping transactions into unique product varieties within detailed product categories by implementing a product match-adjusted R-squared method that statistically ranks each combination of descriptors in transaction records. The best combination results in product varieties that are continuously traded and prices that are closest to the mean price of a variety.
  - Filtering outliers that could cause large fluctuations in monthly price.

- Improve representativity of price index by accounting for current period trade with current period price and quantity from trade transaction records for the subset of homogeneous goods.
- Reduce bias of price indexes by implementing a superlative index methodology to calculate lower-level unit value indexes for the homogeneous product categories, using same-period price and quantity information. This methodology improves the relevance and quality of price indexes by accounting for new and disappearing goods. The methodology also accounts for the seasonality and lumpiness of trade by calculating a mid-term relative between the current period unit price and the previous year's average unit price for each product variety.
- Provide historic time series that allow data users to independently evaluate the comparability of planned and current official price indexes using proposed and current data sources.
- Update the list of publishable import and export price indexes to expand the coverage from a current 700 to approximately 1,200 detailed product and industry price index series, and additionally to expand coverage of country-specific price indexes.

To assure data users that this transition to use administrative data and unit values provides for comparable price index

estimates to the current approach, BLS has provided historical comparisons by calculating a research data series of the detailed 5-digit BEA End Use import and export price indexes for 2012 to 2021. BLS will continue to update the detailed research to current periods and will provide an overlap of the research data series with the official data series, once the transition to including administrative trade records occurs in 2025. The research data series is posted to the MXPI research webpage (<http://www.bls.gov/mxp/data/research.htm>).

## **II. Background**

The import and export price indexes are calculated with a modified Laspeyres formula, using current period prices and fixed trade weights that reflect trade quantities at the time of sampling, and that are adjusted annually. The target population for coverage of these price indexes is merchandise trade, excluding military goods, works of art, used items, charity donations, railroad equipment, items leased for less than a year, rebuilt and repaired items, and custom-made capital equipment. The measures are presented at a national level and are published using three classification systems; by product with the BEA End Use Classification System and the Harmonized System (HS), and by industry according to the North American Industry Classification System (NAICS). The estimates are based on the useable monthly prices of sampled items provided by company respondents to the International Price Survey. The data

collected are based on a sample drawn from the frame of administrative trade data provided by importers and exporters to the U.S. government for regulatory purposes. BLS uses these data solely for statistical purposes.

The number of companies and prices that support the price indexes has declined over time. In the 5-year period from 2017 to 2022, there was a 20-percent decline in the monthly number of prices collected, from 21,800 to 17,000. While the quality of the top-level price indexes has been sustained, the reduction in the number of prices has negatively impacted publishability of detailed price indexes and thus the relevance of the statistical measure for data users. An initiative to evaluate the unit prices of administrative trade records to replace prices reported in the directly collected survey was begun in FY 2018 in response to the decline in prices collected. The research initiative has successfully shown that unit values from Census administrative trade records can be used in estimating import and export price indexes for many homogeneous product categories, because the price indexes using the new source and method show similar trends to the current official measures. The new approach also mitigates bias in the indexes and significantly reduces respondent burden.

### **III. Differences in Concepts and Methods Using Census**

#### **Administrative Trade Data Source for Homogeneous Product**

## **Categories**

Using the data source of administrative trade transaction records in a new way to estimate prices requires changes to concepts, design, and calculation methods for this subset of the target population. This change in the source introduces a major expansion of coverage of homogeneous product categories while also reducing respondent burden. Because unit value price concepts are used for administrative trade data, the focus of the improvement is on homogeneous product categories. The changes to concepts and methods introduced by the change in source data are consistent with internationally recognized approaches to calculating price indexes, and the concepts and methods used complement those used for the directly collected business survey. The changes to concepts are: 1) price concepts, and 2) units and periodicity of collection. The new concepts are relevant only to the subset of homogeneous product categories. The change to design affects the subset of the target population of merchandise goods whose price source is administrative trade records; these product categories will no longer be sampled. The changes to methods are relevant only to the subset of homogeneous product categories; furthermore, these new methods are only for calculations of the unpublished lower-level price indexes for 10-digit Harmonized System (HS) product classification groups. New calculation approaches for the unit value indexes for the subset of homogeneous products cover 1) calculation of unit value indexes and aggregation, including

treatment of outliers, 2) substitution procedures, 3) imputation, 4) starting a series, 5) variance estimates, and 6) sources of error. There are no changes to the aggregation method of calculating price indexes from the lower level to the published strata.

*Price concepts for administrative trade data source.* The current preferred price concept for directly collected prices is a transaction price in the currency traded excluding fees, taxes, and duties. The new price concepts for the administrative trade data source are dependent on the regulatory requirements for data entry. All prices are border transaction prices. Prices are reported in U.S. dollars. The reporting requirements specify that the dollar value of the shipment is to be recorded, excluding insurance, freight, and duties. This dollar value, in international commercial (INCO) accounting terms, aligns with the free on board (f.o.b.) cost basis for imports, and the free alongside ship (f.a.s.) basis for exports, both of which exclude insurance, freight, and duties.

In addition, the price definition used for the administrative trade data is a unit price, and the lower-level index calculated from the unit price is the unit value index. The unit price is an average price of a subset of administrative trade transactions grouped by similar characteristics to create unique matched-model product varieties that are then able to be

consistently priced over time. Grouping administrative records into product varieties adheres to international best practices, which establish that unit values should relate to a single homogenous product whose specifications should remain constant.

The new concept of unit price is based on the data fields reported in the administrative trade data. Each record reports the product quantity traded and total trade dollar value for a specific shipment by a specific company for a specific 10-digit HS product category, for a point in time (i.e. the date of arrival or departure from the U.S. port). The unit price for each individual shipment is a product's total trade dollar value divided by the quantity. The shipment records are grouped by data fields into product varieties. The selection of the data fields to group records into distinct product varieties uses a match-adjusted R-squared approach (MARS); data field combinations are ranked based on the explained variance in product unit prices with product match over time, using a stratification scheme based on the 10-digit HS product classifications that include a 5-digit BEA End Use product category. Product varieties are established as a combination of characteristics by BEA End Use strata using the MARS analysis. Once the characteristics are selected, records with the same characteristics are grouped into a unique product variety to calculate a quantity-weighted average unit price. The average unit price of each unique product variety is aggregated into a

larger product category by HS classification to calculate a unit value index. (See *New and enhanced methods to calculate and aggregate unit value indexes.*) The unit value index is equivalent to a directly collected item price for calculation purposes. The characteristics of product varieties will be reviewed when major revisions occur in the HS product classification structure. Any change in HS product classification or product variety will be linked to continue a time series.

*Units and periodicity of collection.* The current concept of periodicity of collection for the directly collected survey is that the preferred price for items reported by a respondent is the transaction price for an item traded in the reference month as near as possible to the first day of the month. The new concept for the subset of homogeneous products using administrative trade records is to account for all transactions throughout the reference month and to calculate a weighted average unit price for each detailed product variety. The reporting requirements for trade data extend beyond the calendar month, so that the preliminary estimate of MXPI will not include all trade during the reference month. Subsequent revisions to the MXPI will incorporate all transaction records for the reference month that meet data quality verification criteria.

*New and enhanced methods to calculate and aggregate unit value*

*indexes for homogeneous product MXPI.* Unit value indexes are reliably estimated using an estimation approach that incorporates new methods, enhancements to current methods, and continuation of other methods currently in use.

*New approach to calculation of unit value indexes.* The current approach to account for those homogeneous product categories that use an average, spot, or unit price, for homogeneous product types such as grains, metals, and crude petroleum, is 1) to record the price for the homogeneous product category as a unit price for an item, and 2) to use the corresponding trade dollar value for the product category for aggregation. For crude petroleum imports, specifically, the current method is more refined; using the administrative data of imported crude petroleum collected by the U.S. Energy Information Agency, BLS calculates a weighted average unit price of each unique crude oil stream, all of which are then aggregated to a single unit value index for the crude petroleum product category.

This current approach to using unit prices is enhanced for use with administrative trade data. At the index calculation level of published strata, the current approach for estimating published strata with average, spot, or unit prices remains the same. A new method has been implemented to calculate the unit prices of administrative trade transactions and to aggregate these transactions into unit value indexes. The new method

accounts for the availability of current period quantity data in the administrative trade data. The new method results in a significant quality improvement that mitigates new goods and substitution bias by using the current period trade weights in a superlative index formula.

The superlative index formula used for calculating the unit value indexes is a Tornqvist formula. A Tornqvist price index first calculates a geometric average of the price relatives of the current to base period prices. Current period prices are calculated for each of the 4 months of the revision period. Base period prices are the arithmetic average of all prices of the previous year. The ratio of current-period price to previous-year price, also called a mid-term relative (MTR), is calculated for each month. The Tornqvist calculation then weights the MTR price relatives of the product varieties by the arithmetic average of the value shares for the two periods to calculate the unit value index for each 10-digit HS product classification group. The index levels in each month are then linked to calculate month-to-month price changes for each classification group. Using an entire year for the base period implies that any product variety that was traded the previous year contributes to the index, even if they were not traded the previous month. This approach greatly increases the number of product variety prices used in the unit value index estimation. The unit value index, once calculated, is then treated as a unique item price and then

aggregated to the publication-level industry or product import or export price index using the current modified Laspeyres index method.

*New approach to aggregation.* The current method to estimate the published Import and Export Price Indexes uses the monthly prices of directly collected items to calculate each item's price change, as well as sample weights and company weights, to aggregate to a 10-digit HS product classification group. The next step then aggregates the price change of the 10-digit classification group with annual trade weights from the calendar year ended 2 years prior to the current calendar year to calculate a modified Laspeyres price index for each classification system. The aggregation uses the concordance between the Harmonized System and the other two classification systems of BEA End Use and NAICS. With the new data source, aggregation does not require sample or company weights. Each unit value index is equivalent to an item price in the calculation of import and export price indexes. Thus the item prices that are aggregated to the published indexes are composed of directly collected prices and unit value indexes. Together they form two non-overlapping subsets of item prices that cover the target population of merchandise goods trade. The first subset consists of the monthly prices of directly collected items for product categories that do not meet the quality criteria for unit value indexes. The second subset consists of

the unit value indexes for product categories that meet the quality criteria for use. The primary product classification is the BEA End Use product classification, and the detailed 5-digit BEA End Use import and export price indexes will be based on either the survey data or administrative trade data. However, at the higher levels of aggregation and for other classifications, most other published indexes will be composed of some combination of the two data sources.

The subset of country-specific NAICS price indexes, called locality of origin and locality of destination price indexes, are used to measure U.S. competitiveness with trading partners. The current sampling approach does not account for locality, but the locality price indexes are quality-reviewed for publication. The revised approach to calculating and publishing locality price indexes will blend directly collected items with locality-specific unit value indexes. Product varieties will be grouped by country and locality before their prices are aggregated to unit value indexes. Locality-specific unit value indexes are weighted by the locality-specific dollar value of trade from the transaction to the unit value index level. Each locality-specific unit value index is mapped to a classification group and then aggregated to the locality-specific 6-digit NAICS industry category using the current modified Laspeyres index method. Some published indexes will be composed of some combination of the two data sources.

*New treatment of outliers.* A new approach has been developed to assure fitness for use of the transactions comprising each 10-digit HS product category that will replace the directly collected survey data. This approach eliminates transactions that are not useable and excludes outliers at the tail ends of the distribution of price and quantity. Excluding outliers mitigates the occurrence of unit value bias. Previous research has identified the fitness for use of 10-digit HS product categories by comparing multiyear trends of price indexes that are composed of current data sources and administrative trade data, respectively. When price index trends are shown to be statistically consistent across years and months, administrative trade data are selected to replace current data sources. Subsequently, once the administrative trade data are in place in the official price indexes, procedures must be in place to evaluate and eliminate those transactions that are outliers, i.e., that differ greatly from the average trade transaction that make up a 10-digit HS product category. The exclusion of outliers will reduce the occurrence of unit value bias by limiting the variability that contributes to the bias and will assure the quality of the price indexes.

The administrative trade data are filtered to exclude missing data and outliers using automated microdata review processes. Regarding missing data, transactions with null data fields are

excluded. Transactions with a null quantity data field for which the quantity is imputed are excluded from unit price calculation. However, the dollar-value weight is included for unit value index calculation. Regarding trimming outliers, four procedures are implemented progressively to trim quantities and filter unit prices and price changes to apply the matched-item approach and mitigate unit value bias. First, unit prices for each transaction are calculated, after which a set percent of the quantity is trimmed equally from both tails of the unit price distribution within the product variety; then the transaction unit prices are weighted using the trimmed quantities to calculate an average weighted unit price for the product variety. Thus, the largest and smallest transaction unit prices will have less impact on the weighted unit price of a product variety, which mitigates unit value bias. Second, the coefficient of variation value of the weighted unit price of each product variety is calculated; for any product variety's price whose coefficient of variation is over a set threshold, that product variety displays unit value bias, and thus is excluded from the unit value index calculation. The exclusion is conditional on the dollar-value weight of the product variety not exceeding 10 percent of the trade dollar value of the detailed BEA End Use stratum to which the variety's corresponding 10-digit HS product classification is mapped. Thus, this step excludes the product variety prices that show unit value bias while assuring representativeness. Third, the

mid-term relatives (MTRs) are calculated for each product variety, using the average unit price in the reference month and the variety's base price from the previous year. The MTRs of all product varieties that comprise each 5-digit BEA End Use strata product grouping are sorted by magnitude, and MTRs on the tails of the distribution are trimmed for those values that extend beyond a previously established outlier threshold; the corresponding trade weights are also excluded in the index aggregation. This step uses historic research data to establish the outlier threshold. Fourth, in monthly production, automated flags identify outliers of product variety prices based on established thresholds relating to larger than average price movements. Individual product variety prices are compared over time and across varieties to determine statistical validity. Data values that do not meet established parameters are excluded.

*Enhanced method for substitution.* Current substitution procedures and practices in the survey allow for item substitution, in which a previously traded item is replaced with a new item from the same company and within the same commodity classification group. Current imputation procedures and practices allow for an imputed or estimated price to be entered when there are missing price data.

The new approach for items comprising HS product classification

groups using administrative trade data does not substitute items. However, the new approach will immediately account for substitution in trade. There is no substitution procedure to replace items missing in trade, because the administrative trade data account for the natural occurrence of all trade. For unit value indexes, which are mapped to HS product classification groups, the lack of an observation is not an indication of missing data, it is rather an indication of no trade in that period.

*Enhanced method for imputation.* The current imputation approach is to impute or estimate a price when there are missing price data and when starting a series. The new approach for items comprising HS product classification groups using administrative trade data depends on the level of calculation. At the level of product varieties, imputation is not used when a product variety has no unit price, because the lack of a unit price indicates an absence of trade. However, imputation is used when starting a series for a new product variety. A new product variety naturally occurs in trade, which is characterized by a not-previously defined combination of shared characteristics for the selected data fields in an HS product classification category.

*Enhanced method for starting a series.* The current method for starting a price series, or initialization, is to impute the first price of an item based on the value of the index for the

weight group. The enhanced method for starting a price series is to impute the first price of a product variety from the unit value index that is calculated from all other product varieties in the same HS-product category. The mid-term relative (MTR) method is then used to calculate the current period price relative. The current imputation approach for imputing a missing price at the classification group level does not change.

*Variance estimates for administrative trade data.* The current approach for calculating variance estimates will not be revised; variance is calculated for price indexes that consist of sampled prices and are not calculated for price indexes that consist of prices collected from non-sample sources. For those price indexes that will be calculated with administrative trade data in place of directly collected survey data, no variance estimate will be calculated.

*Sources of error in administrative trade data.* The current sources of error for survey data are a combination of sampling and nonsampling error. Sampling error is not relevant to price indexes calculated using administrative trade data because these are not sample data. With the new administrative data source, there are a few potential sources of error. Processing error is one source of nonsampling error that is introduced with the use of the administrative trade data. Among the transaction records processed by the Census Bureau, some records have incomplete

data and are not used in BLS calculations. Additionally, there is measurement error in assuming that the characteristics that make up a product variety adequately explain the month-to-month price change movements. Furthermore, other records are analyzed and excluded from calculation because they are at the tails of the distribution of prices or quantities and are excluded in order to reduce the variability of unit prices and unit value indexes. The exclusion of transactions with missing data and estimates at the tails of the distribution may result in bias or a skewed result if there is a repeatable pattern in either set of data, such that certain companies have more transactions with missing data or with widely variable prices. These nonsampling errors cannot be measured with current methods and there is little actual research on this topic for administrative data that represents the full population; however, research has begun and is ongoing to evaluate sources of error. This research includes methods to adequately explain mean square error for index estimates that are constructed from the integration of administrative data and sampled survey data.

*Publication of official MXPI.* Current publication procedures for price indexes require an annual review of statistical robustness that include sample representativeness and that assure the protection of respondent and company identifiable information. Revised publication procedures for price indexes calculated with administrative trade data will be put in place. Current

procedures limit publication of indexes that represent commodity areas with a minimum dollar value of annual import or export trade value. New procedures for administrative trade data will not require a minimum dollar value for publication. Protection of respondent and company identifiable information will remain in place and thus not all price indexes using administrative trade data will be published separately.

Modified publication procedures are in place to evaluate the price indexes selected for inclusion in the aggregation. Up to the date of publication, a research data series using the new methods will be calculated to compare monthly and long-term variability and skewness relative to the official price indexes using current methods to assure quality and consistency before incorporating the administrative trade data in the official data release. When a detailed product area is either under-represented in the sample or difficult to collect, a price index representing commodity areas with smaller dollar values may use administrative trade data. This approach increases efficiency and mitigates respondent burden, even if some bias exists, as long as the bias does not have an impact on the upper-level indexes.

*Publication.* Another important improvement is that the methods allow for an expansion of the number of publishable price indexes. The enhanced procedure will convert roughly 7 million

transaction records for homogeneous product areas into hundreds of thousands of product varieties, which subsequently will be used to calculate thousands of unit value indexes for 10-digit HS product categories. These unit value indexes are integrated as item prices into the calculation of the MXPI. There is no change to the method of calculating the monthly estimates of price indexes. When the transition to using the administrative trade data occurs, the price indexes currently published will not have a break in series. Under current procedures, new items brought into the price indexes replace discontinued items. With the introduction of the administrative trade data source, new items based on the administrative trade data will be brought in to completely replace directly collected survey data within classification groups that have been determined to meet criteria of homogeneity. Whether a published price index includes administrative trade data will be determined by the concordance between HS classification groups and each product and industry classification. The new approach treats directly collected and administrative data equally, and no distinction will be made in publication of the data source. The transition to using administrative trade data in the official news release will be announced in advance.

This detailed description of the current and redesign approaches complements the research data series that are available at the BLS MXPI Website <http://www.bls.gov/mxp/home.htm>.

#### **IV. Desired Focus of Comments**

This notice is a general solicitation of comments from the public on the technical approach to this major change in the concepts, sources, and methods of the Import and Export Price Indexes.

Signed at Washington, D.C., this 5<sup>th</sup> day of September 2023.

***Eric Molina,***

*Acting Chief, Division of Management Systems,*

*Bureau of Labor Statistics.*

[FR Doc. 2023-19486 Filed: 9/8/2023 8:45 am; Publication Date: 9/11/2023]